

A new species of the genus *Ligia* (Crustacea:
Isopoda: Ligiidae) from the Lake Shinji
(Shimane Prefecture), western Japan

journal or publication title	Bulletin of the Toyama Science Museum
number	31
page range	51-57
year	2008-02-25
URL	http://repo.tsm.toyama.toyama.jp/?action=repository_uri&item_id=875

A New Species of the Genus *Ligia*
(Crustacea: Isopoda: Ligiidae)
from the Lake Shinji (Shimane Prefecture), Western Japan

Maki Tsuge
IDEA Consultants, Inc.
1334-5 Riemon, Ooigawa, Shida, Shizuoka 421-0212, Japan

島根県宍道湖から発見されたフナムシ属 (甲殻綱、等脚目、フナムシ科) の一新種

津下 麻樹
いであ株式会社
421-0212 静岡県志太郡大井川町利右衛門1334-5

従来、日本におけるフナムシ属は7種が記録されていた。今回、島根県の宍道湖から第8番目の種が発見され、新種であると判断した。宍道湖は、大橋川を介して中海と連なる代表的な汽水湖として知られている。本論文では、この種を *Ligia shinjiensis* sp. nov. (和名/シンジコフナムシ：新称) として報告する。

本種は、日本産のフナムシ *L. exotica* 及びリュウキュウフナムシ *L. ryukyuensis* と形態が類似しているが、以下の点で区別することができる。フナムシ *L. exotica* との相違点は (1) 第2触角の鞭数が少ないこと、(2) オス第2腹肢交尾針の先端の形状が丸いこと、(3) 大顎の内葉に刺毛が見られないことで区別することができる。また、リュウキュウフナムシ *L. ryukyuensis* と交尾針が類似するが (1) 第2触角の鞭数が少ないこと、(2) オス第一胸脚指節に突起を有していることで区別することができる。また、残りの5種とは、本種がオス第一胸脚指節に突起を有していることなどで区別することができる。

模式標本は富山市科学博物館に保管される。

Key words : Isopoda , Ligiidae, new species, Lake Shinji, *Ligia shinjiensis*, Japan
キーワード : 等脚目、フナムシ科、新種、宍道湖、シンジコフナムシ

Introduction: In Japan, hitherto, seven species belonging to the genus *Ligia* have been recorded as valid (Nunomura, 1979, 1983, 1990, 1999) : They are *L. exotica* (Roux, 1828), *L. cinerascens* (Budde-Lund, 1885), *L. ryukyuensis* (Nunomura, 1983), *L. boninensis* (Nunomura, 1979), *L. yamanishin* (Nunomura, 1990), *L. hachijoensis* (Nunomura, 1999) and *L. miyakensis* (Nunomura, 1999).

***Ligia shinjiensis* sp. nov.**
(Jap. Name: Shinjiko-funamushi, new)
(Fig. 1)

Material examined: 2♂♂(1♂holotype, 31.4mm in body length, 6.4mm in head width and 1♂ paratypes 29.1mm in body length) and 1♀(paratypes, 27.6mm in body length) ; The Lake Shinji, Tamayu, Matsue City, Shimane Prefecture, Western Japan, 8 July 1998, coll. Maki Tsuge. 1♂ (paratype, 25.4 mm in body length) and 2♀ (paratypes 26.3-31.6 mm in body length), the lake Shinji, Tamayu, Matsue City Shimane Prefecture coll. Maki Tsuge, 4 May, 2004. Types series is deposited as follow: holotype (TOYA-13633), and 5 paratypes, at the Toyama Science Museum (TOYA-

13634~13635, 13682~13684). These individuals were collected from the crack of the embankment near the shore in the lake.

Description: Body (Fig. 1A) oval, 2.3 times as long as wide excluding uropods and antennae, but 3.8 times as long as wide including uropods. Color grayish brown. Surface almost smooth, with sparsely scattered minute granules. Pleotelson with 2 pairs of deep concavities, and with protruded medial tip. Eyes reniform.

First antenna small; first segment rectangular; second segment with much setae; terminal segment round. Second antenna very long, reaching the middle part of basis and composed of 5 peduncular and 32~38 (34.5 ± 1.8 $n=265$, head width > 4.0mm) flagellar segments. In the case that head width not exceeds 4.0mm, the individual difference is seen consisting of different the growth stage.

Mandible, right mandible (Fig. 1B), pars incisive with 3 teeth; lacinia mobilis with 1 bigger and 4 smaller teeth; a tuft of about 15 plumose setae; processus molaris wide. Left mandible (Fig. 1C), pars incisive with 3-toothed; lacinia mobilis chitinized and 3-toothed; a tuft of about 15 plumose setae behind the lacinia mobilis; processus molaris wide.

Maxillula, outer lobe (Fig. 1D) with 12 teeth on the distal margin; 5 of which teeth are chitinized; The other 7 teeth are slender. Inner lobe with 3 plumose setae at the tip. Maxilla broad and weakly bilobed in 2 lappets.

Maxilliped (Fig. 1E), endite with about 26 stout spines and much hair. Palp composed of 5 segments; Segment 1 without setae on inner margin but 1 spine on outer margin; merus with much setae on inner margin and 8 spines on surface; carpus with much setae on inner margin and 9 spines on outer margin; propodus with much setae on inner margin and 6 spines on outer margin; dactylus round, with much setae around the margin.

Pereopod 1 (Fig. 1F). Basis without spine on inner and outer margin and 1 spine at distal angle. Ischium with 2 spines on inner margin, 3 spines on outer margin and 6 spines at distal angle. Merus without spine on inner and outer margin and 7 spines on distal margin. Carpus with 2 spines on inner margin and without spine on outer margins and 6 spines at distal angle. Propodus slender, with 4 spines on inner margin and 1 spine on outer margin; dactylus with protuberance, but only in male.

Pereopod 2. Basis without spines on inner and outer margin and 1 spine at distal angle. Ischium, merus, carpus with much spines on inner and outer margins, and at distal angles. Only second and third pereopods without spine of propodus on inner margin.

Pereopod 3. Basis without spine on inner and outer margins and 5 spines at distal angle. Ischium, merus, carpus with much spines on inner margin and outer margin, and at distal angle. Only second and third pereopods without spine on under margin of propodus.

Pereopod 4. Basis without spine on inner margin but with 1 spine on outer margin and 6 spines at distal angle. Ischium, merus, carpus with much spines on inner and outer margin, and at distal angle. Propodus slender, with 4 spines on inner margin and 1 spine on outer margin.

Pereopod 5. Basis with 3 spines on inner and 1 spine on outer margin but without spine at distal angle. Ischium, merus, carpus with much spines on inner and outer margin, and at distal angle. Propodus slender, with 7 spines on inner margin and 1 spine on outer margin.

Pereopod 6. Basis with 2 long and 22 short spines distal angle. Ischium, merus, carpus with much spines on inner and outer margin, and at distal angle. Propodus slender, with 7 spines on inner margin and 1 spine on outer margin. Pereopod 7. Basis with 2 spines on inner margin and without spine on outer margin and 13 short spines at distal angle. Ischium, merus, carpus with much spines on inner and outer margin and at distal angle. Propodus slender, with 9 spines on inner margin and 1 setae on outer margin.

Penes paired and each penis slender, with much hairs on distal margin.

Pleopod 1 rhomboid.

Pleopod 2 in male. Endopod long (Fig. 1G, H), round terminal part of stylus, with numerous denticles. Exopod round.

Pleopods 3~5 rhomboid.

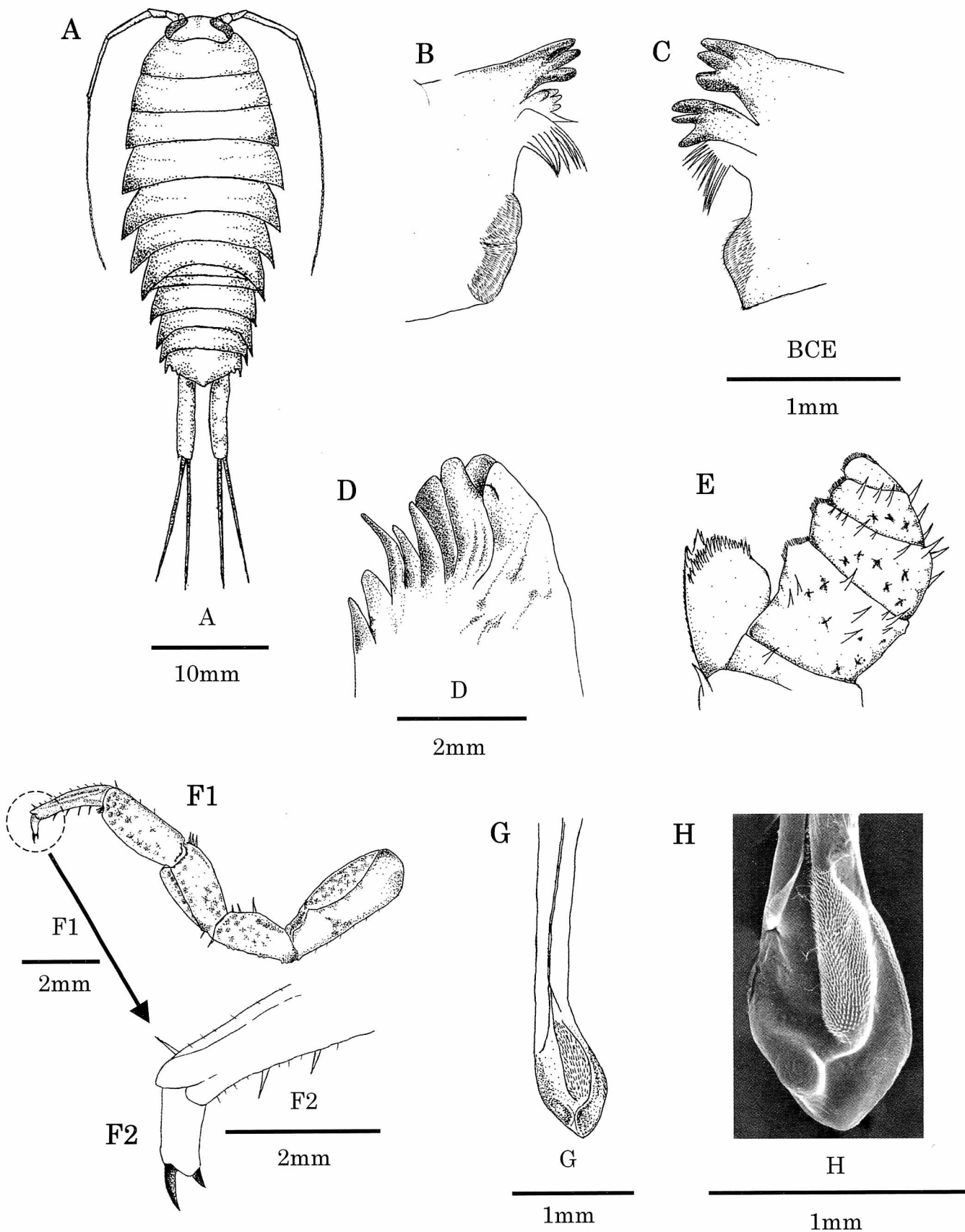


Fig. 1 *Ligia shinjiensis* sp. nov.

A. Dorsal view; B. Right mandible; C. Left mandible; D. First maxilla; E. Maxilliped; F. Male first pereopod; G. Stylus of male second pleopod; H. Apical part of the same taken by the electron microscope (A-G. Holotype).

Uropod. Uropod long and occupies 39% of the body length. Both rami almost equal in length.

Female without protuberance on dactylus of pereopod 1. Second antenna very long, reaching the middle part of basis and composed of 5 peduncular and 32-38 flagellar segments. Pleopod 2. Endopod long, terminal part swollen.

Etymology: "Shinji" is the name of the lake where the types series was collected.

Distribution: *L. shinjiensis* sp. nov. is distributed from the Lake Shinji to a part of Ohashi river and distributed at the shore of Lake Jinzai (brackish water lake, located in the east part of Shimane Prefecture Izumo City).

Remarks

Hitherto, in Japan the following seven species of the genus *Ligia* have been reported: Nunomura (Toyama Science Museum), *L. cinerascens* (Budde-Lund, 1885), *L. exotica* (Roux, 1828), *L. ryukyuensis* (Nunomura, 1983), *L. yamanishii* (Nunomura, 1990), *L. boninensis* (Nunomura, 1979), *L. hachijoensis* (Nunomura, 1999), *L. miyakensis* (Nunomura, 1999).

The eighth species in Japan have been discovered from the Lake Shinji in Shimane Prefecture (Western Japan). The Lake Shinji, typical brackish lake, is connected with Nakaumi through Ohashi river (Fig.2). The present new species is described *Ligia shinjiensis* sp. nov.

This species is most allied to *L. exotica*, but the former is separated from the latter in the following features: (1) less numerous flagellar segments of the second antenna, (2) round terminal part of stylus on male second pleopod and (3) absence of seta on lacinia mobilis of right mandible.

This species is also allied to *L. ryukyuensis*, about the tip structure of stylus on male second pleopod, but the former is separated from the latter in the following features : (1) less numerous flagellar segments of the second antenna, (2) presence of protuberance on male first pereopod.

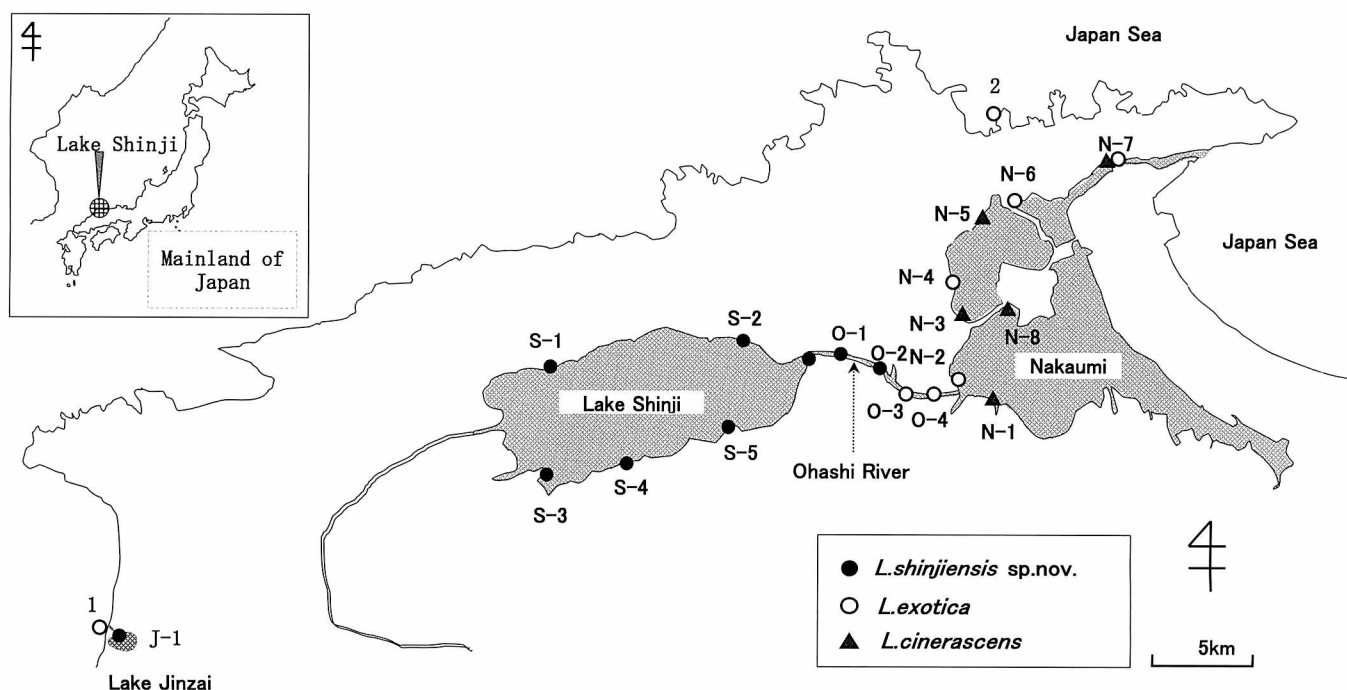


Fig. 2 The distribution of genus *Ligia* in the Lake Shinji, Nakaumi and Japan Sea.

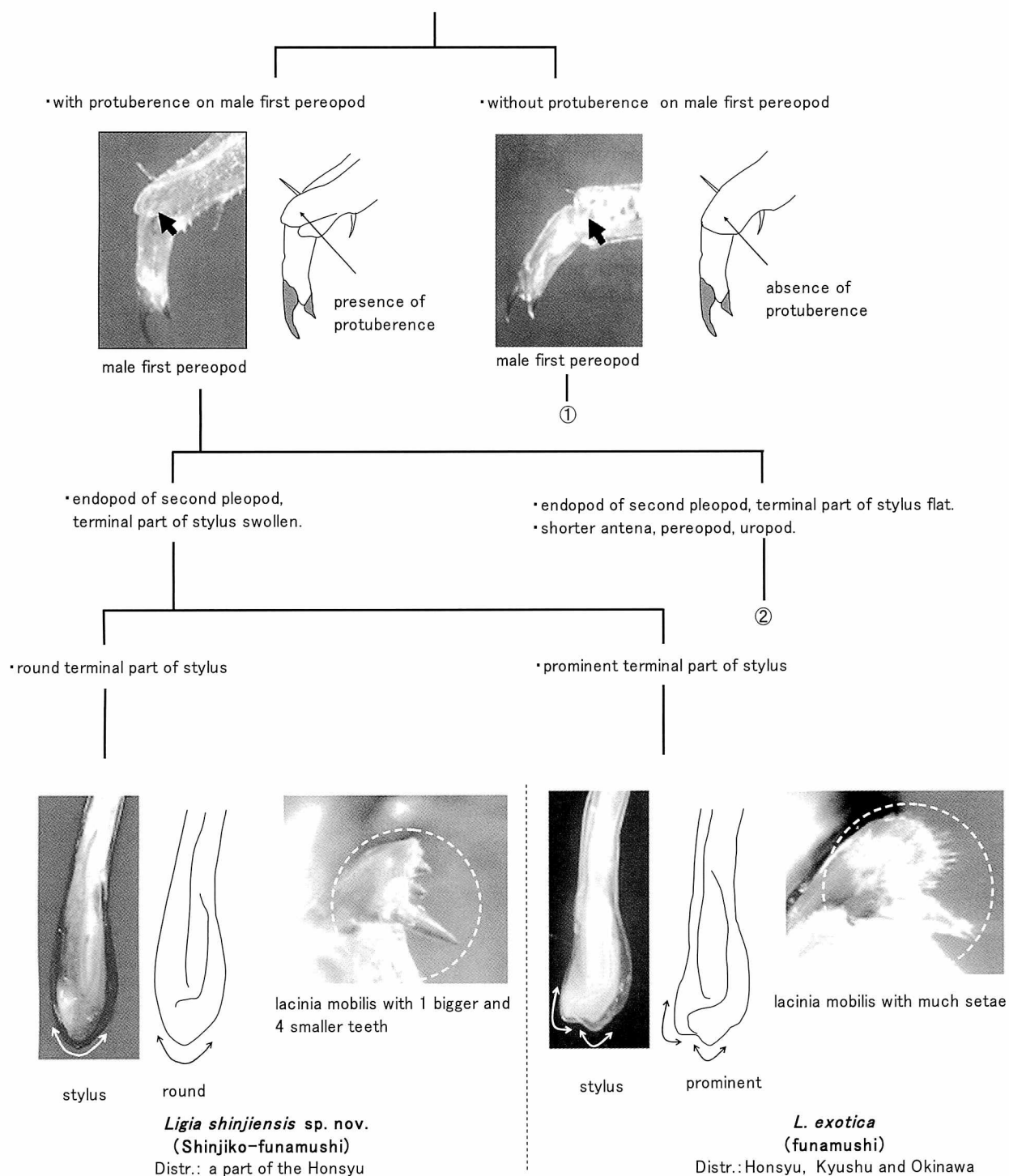


Fig. 3-1. Key to the species of the genus *Ligia* in Japan .

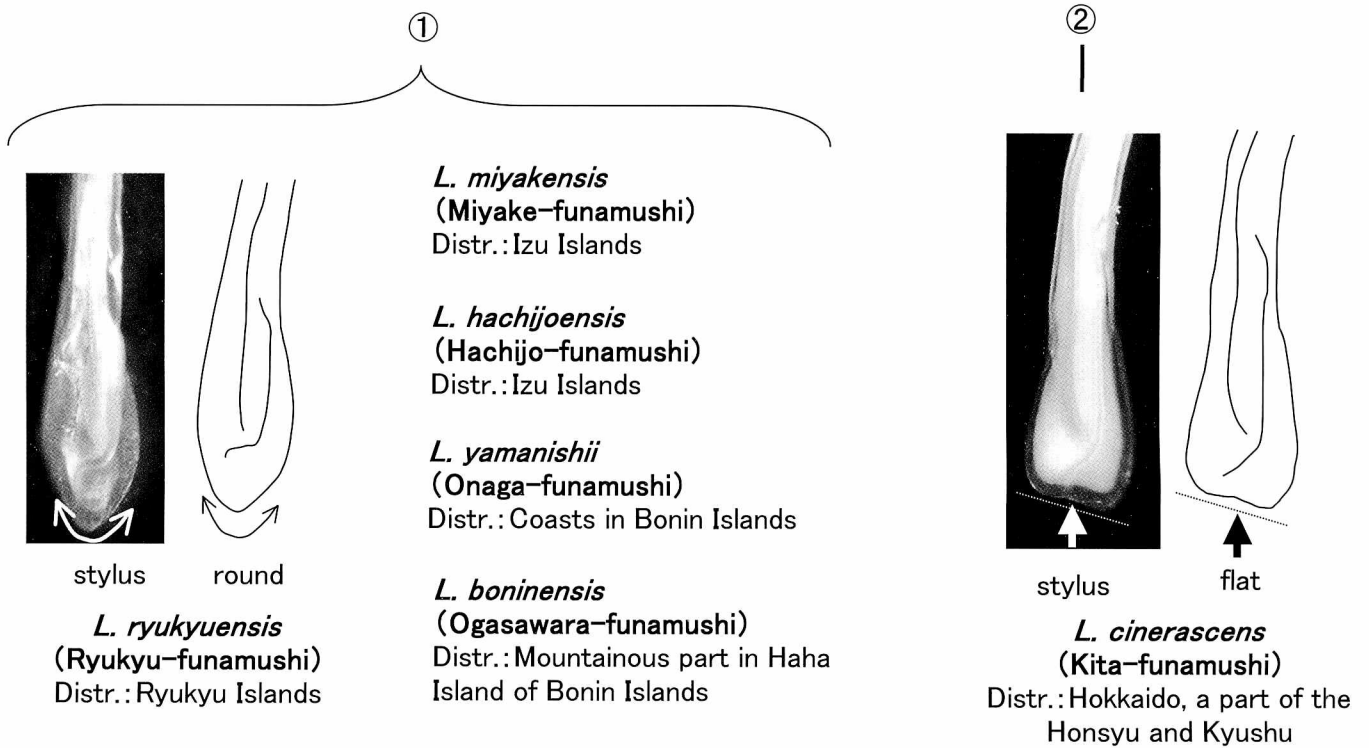


Fig. 3-2. Key to the species genus *Ligia* in Japan.

Table 1 Compare of 8 species of the genus *Ligia* in Japan

species	feature	Flagellar segments the second antenna	protuberance on male first pereopod	apical part of stylus	distribution
<i>L. shinjiensis</i> sp. nov.		32-38	○	round	a part of the Honsyu (The Lake Shinji, The Lake Jinzai)
<i>L. exotica</i>		34-48	○	prominent	Honsyu, Kyushu and Okinawa Island
<i>L. cinerascens</i>		22-27	○	flat	Hokkaido, a part of the Honsyu and Kyushu
<i>L. ryukyuensis</i>		32-38	×	round	Ryukyu Islands
<i>L. miyakensis</i> ※		56-62	×	swollen	Miyake Island(Izu Islands)
<i>L. hachijoensis</i> ※		42-48	×	swollen	Hachijo Island(Izu Islands)
<i>L. boninensis</i> ※		22	×	swollen	Mountainous part of Haha Island (Bonin Islands)
<i>L. yamanishii</i> ※		32	×	swollen	Coasts in Bonin Islands

(※Nunomura 1979, 1983, 1990, 1999)

Acknowledgements

I wish to express my heartfelt thanks to Mr. N. Nunomura, Toyama Science Museum and Dr. M. Murano, Tokyo University of Marine Science and Technology for their valuable suggestions, and critical reading of the manuscripts, and Mrs. Y. Itani who analyzed mitochondria DNA of *Ligia shinjiensis* sp. nov. and other species (Itani, Y., (m. s.)). Thanks are also due to Mr. T. Torii, the member of the IDEA Consultants, Inc. for the help in using a scanning electron microscope.

References

- Itani Y., 1999. Molecular phylogeography of the genus *Ligia* in Japanese islands. *The Nature and Insects* 34 (2): 39-41.
- Nunomura, N., 1979. *Ligia boninensis*, a New isopod crustacean from Haha- Jima Island, Bonin Islands, Japan. *Bull. Toyama Sci. Mus.*, 1: 37-40.
- Nunomura, N., 1983. Studies on the terrestrial isopod crustaceans in Japan. I. Taxonomy of the families Ligiidae, Trichoniscidae and Olbrinidae. *Bull. Toyama Sci. Mus.*, 5: 23-68.
- Nunomura, N., 1990. Studies on the terrestrial isopod crustaceans in Japan V. Taxonomy of the families Armadillidiidae, Armadillidae and Tylidae, with Taxonomic Supplements to some other families. *Bull. Toyama Sci. Mus.*, 13: 1-58.
- Nunomura, N., 1998. Marine Isopod Crustaceans collected from Noto Peninsula, Middle Japan. *Bull. Toyama Sci. Mus.*, 21: 43-43.
- Nunomura, N., 1999. Sea Shore Isopod Crustaceans collected from Izu Islands, Middle Japan. *Bull. Toyama Sci. Mus.*, 22: 24-29.
- Saito, N., Itani, G., Nunomura N., 2000. A Preliminary Check List of Isopod Crustaceans in Japan. *Bull. Toyama Sci. Mus.*, 23: 78-80.
- Nunomura, N., 2004. Marine isopod crustaceans collected from Izu Peninsula, Middle Japan. *Bull. Toyama Sci. Mus.*, 27: 12-13.
- Nunomura, N., 2005. Sea Shore isopod crustaceans from Bonin Islands. *Bull. Toyama Sci. Mus.*, 28: 51-51.
- Schmalfuss, H., 2003. World catalog of terrestrial isopods (Isopoda: Oniscidea) Stuttgarter Beitr. Naturk. Ser. A, Nr. 654. 1-341.